DOMESTIC ENGINEERING

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Suggestion:
Cut out; frame neatly; put in show window; change weekly.

PLAN YOUR PLUMBING.

When you build instruct your architect carefully to locate every drain, every clean-out, every shut-off cock, every riser, every vent pipe and stack and every waste pipe and stack. Save the plan, for some day you will want to get at some of those pipes quickly and economically. If you are careful to do this and then wise enough to use only high-grade goods bearing the maker's name and guaranty, you certainly will have satisfactory plumbing,—especially if we do the job.

The Pay of a Capable Chief Sanitary Inspector

The value of a good inspection service in the health department of any city can scarcely be overstated. During the last few years Chicago has been exceptionally fortunate in having in the office of chief sanitary inspector one who has had the training which would permit him to serve the city in a thoroughly satisfactory way, and the spirit which prompts him to give to the city the very best work of which he is capable. It was but natural that in the early days, with insufficient recognition of the necessity of an inspection department, with a lack of recognition on the part of the finance committee of the common council of this city, and with consequent failure to provide sufficient funds for enforcing sanitary ordinances, that Chicago should have been provided with inefficient methods of inspection and that these should be accompanied by laxity in administration of sanitary ordinances. I am glad to say that this inefficiency and laxity have disappeared, and have given place to an exceedingly efficient administration. For the success which now characterizes the administration of the health department of Chicago, a larger degree of success than has ever before been given to our citizens, Dr. W. A. Evans, the Health Commissioner, should have ample credit; but this success would not have been possible if he had not been assisted by competent chiefs of departments, and of these the Chief Sanitary Inspector, Charles B. Ball, is conspicuous.

A slight review of some of the more important things which Mr. Ball has accomplished for Chicago will show other Inspectors of Plumbing what is possible to be performed for the municipalities which they serve. In addition to carrying on the daily administration of the bureau, a task full of minute detail, and constantly increasing its efficiency and morale, Chief Sanitary Inspector Charles B. Ball has performed constructive work, the effect of which will continue while Chicago remains a city, and which will radiate to every other city which looks to us for an example. Mr. Ball has systematized the records and field control of a force of 85 employees. In one year he made sanitary inspection of over four hundred tenement houses, relieving many unsanitary conditions and causing revision of the city ordinances with reference to the construction of such buildings, which will be far reaching. In the next year he made sanitary inspections of over two hundred public school buildings, in which conditions which did not come up to modern sanitary requirements were reformed. In addition to the work which could be performed by Mr. Ball as an

(Concluded on page 287)

Our Home Bath-Room

AN ARTICLE TELLING WHY THE PLUMBER SHOULD NOT ALWAYS BE BLAMED.

By Charles B. Starkey.

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I desire in this article, for reasons which will be perfectly plain when you have read this little speech, to consider the bath-room from a somewhat different standpoint in regard to the sanitary points, than the general run of articles which touch upon this subject.

We have all heard a great many things both good and bad about the plumber. How he did various things which he should not have done; vented or failed to vent, installed the fixtures after various fashions, but here are some points which places some of the blame upon other shoulders, and let us be thankful that, for once, the plumber can have a much-needed rest.

Not long since the writer visited a house, upon request, to look over a bath-room and locate the trouble. The complaint was made that the plumber had not done his work properly and that "sewer gas" was present in the room.

So the writer went up one afternoon to look the job over, and was prepared to find any of the usual troubles generally found in such cases. To my surprise the job looked all right, worked all right and upon closer inspection was all right. The plumber had installed everything in a workmanlike manner, and all the fixtures were of good reliable brands.

It did not take me very long to locate the source of the trouble, and it is told in a word of four letters, **Dirt.** That was it. A Simon pure case of neglect upon the part of both the house-wife and the architect, for each of these individuals was equally guilty, and the blame had been put upon the shoulders of the plumber.

Did I say anything about matters? You can wager that I made a few remarks that did not fit very comfortably from general appearances.

I do not believe that the bath-room had been thoroughly cleaned out for some time. In the first place it was not possible to do so, as the general arrangement of things was against this, but it could have been much cleaner than it was when I saw it.

The blame for the improper floor, ceiling and walls rested upon the shoulders of the architect. He should have known better, for that was his part of the business.

The walls of any bath-room should be so constructed that they can be washed thoroughly and frequently, and so that no steam will affect them. I am not in favor of placing tiling in the vestibule and plastering the walls and ceiling of the bath-room. Rather than do this, if one had to cut the price, it would be better to cut down on the vestibule.

If there is one place more than another where tiling should be used it certainly is in the bath-room.

The way I look at it is that the bath-room should be so constructed that, if necessary, a hose could be turned into it and the room washed down.

It pains me to say it, but that would be about the only effective mode of keeping it clean in certain cases, and the people who are so careless and neglectful would be highly indignant if they were talked to as they deserve.

This particular bath-room that I visited had three dirty rumbled up rugs kicking around upon the floor. The walls were very dirty, and the porcelain fixtures were anything but clean.

The bath-room was located badly as regards to obtaining a thorough ventilation—more fault due entirely to the architect—and had one small window only, which was tightly closed.

In the course of my remarks to the owner, I said: "You do not need a plumber here. The system is all right. What you mostly need is fresh air and a good, husky scrubwoman. Turn her loose in this room and let her dig it out thoroughly. Then apply your common sense ever afterward to the problem and you need have no fear of 'sewer gas.' Lock up that closet and throw the soiled towels some other place than in that catch-all; get about thirty or forty of these old bottles out of the room and leave all the rugs out but one, which shall be kept perfectly clean and wholesome. See that the porcelain fixtures are cleaned each day and have the room aired out frequently, upon which line of treatment it will be in a more sanitary condition."

Simply a case of, well, let us be kind and say, **carelessness.** Was this an exceptional case? Ask any journeyman plumber and listen well to the story he may tell you. Go visiting and observe, or take a tour around any large city in search of a flat or house to rent, and use your eyes and tell me how far wrong I am when I say that the insanitary condition of many a bath-room, where the blame

is laid upon the shoulders of the plumber, is due simply to the neglect or ignorance of the owner.

I said **many bath-rooms,** bear in mind, not all bath-rooms. The bath-room should be the very cleanest room in the house. I do not except the kitchen even in this respect, for in these days where hundreds of thousands of people are crowded into our large cities within limited areas, the bath-room is one of the most important features of the house or flat. People will wake up to this point sooner or later.

The effect of the best job that an expert plumber can do, can soon be spoiled by carelessness or the lack of knowledge upon the part of the architect, or the stinginess of the owner. These are some points out of the run of the general considerations of bath-room articles, which should be thoroughly considered by not only the householder and architect, but the plumber himself, simply in self-defense. If the public does not know, or is too careless to care, dwell upon some points on general cleanliness. Sure, they are always more than ready to pick flaws with both the plumber and material. Why not perform a really charitable act and scatter a little general education?

There is certainly need enough of it, and probably within a stone's throw of where some one may be reading this very article.

If the owner then does not know what is proper along the lines of the floor, walls and ceiling of a bath-room, why tell him, and also give reasons. Call attention to the necessity for good light (both natural and artificial), and also as good ventilation as it may be possible to secure.

It might also be well to have that old motto pasted up somewhere in a convenient place. I refer to the one which says: "Cleanliness is akin to Godliness." It is certainly **pat** in more parts of the country than one would believe upon first thought.

Told in Denmark.

Returned Explorer—Yes, the cold was so intense at the pole we had to be very careful not to pet our dogs.

Miss Youngthing—Indeed! Why was that?

Returned Explorer—You see, their tails were frozen stiff, and if they wagged them they would break off.—Boston Transcript.

The Last Hope.

"The court does not see the necessity for according you time to speak on behalf of your client, since he has formally confessed his guilt."

"Only a moment, your honor," insisted the lawyer. "I only want to call your attention to the fact that my client is an awful liar."—Philadelphia Ledger.

From House to Sewer*

By Andrew Rosewater
City Engineer, Omaha, Neb.

From a surface standpoint there is very little to be considered to determine what is to be done to connect a sewer already completed, with the house which has its plumbing work ready for sewer connection. This was the opinion twenty-five years ago when the practice prevailed of issuing a sewer permit to anyone desiring to connect a building with the sewer. The Engineer was simply expected to furnish the information as to where the "Y" was located to which connection was to be made. The question of grade, of direction of line, was left entirely to the drain layer who did the work and he frequently began at the building and laid the pipes in a "go as you please" way until he came within eight or ten feet of the junction and then, to use a common phrase, "made it fit."

This class of construction frequently developed depressions between the sewer and house due to abrupt changes in alignment to suit the workman in making connection. Cementing of joints was largely a matter of honesty. No test was made after the work was done and no report filed to show how it was done. As a result, the engineer or his inspector were recipients of blessings from house owners who experienced frequent and uncomfortable stoppages in their pipe connection and always attributed it to the main sewer.

At a time when such construction was prevalent in Omaha, the city had a separate system of sewerage for house waste which had been designed by Colonel Waring upon the beautiful theory that the sewer could not be made too small to insure the greatest flow attainable with a self-cleansing velocity for sanitary results. The mains through the city for this service were six inches in diameter and at first were designed without manholes, the only adjunct being an automatic flush tank at the upper end.

About the time this sewer system was completed, hydraulic elevators were introduced in the hotels and leading business houses in the city, with disastrous results, causing cellars to be flooded following the incapacity of the sewer to carry the flow at specific moments or to overcome the very common mediums of resistance which found their way into the sewer, such as hair-brushes, carpenters'

*Read at the fourth annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, held in Omaha, Nebr., on February 8-10, 1909. This was Mr. Rosewater's last contribution to the literature of the craft, as he passed away a few weeks after.

rules, tooth brushes and in one instance, even a twenty-foot iron rod found its way into the six-inch pipe.

The junctions from the pipe sewer to the houses were four inches in diameter.

It may be interesting to explain how that happened. In this case there seemed to be some stoppage in the six-inch pipe, and we sent the men out with their rods, and they rodded in and out and the stoppage would be removed and the flow would be resumed, and six hours afterwards somebody would report that their cellar was flooded, and the men would go down again and rod and rod, and then perhaps a day or two later the same thing would take place again, and we could not find out what was the cause. Finally, with the use of wire hooks and so on we caught on to something and pulled and pulled and pulled and finally succeeded in pulling out to the man hole an iron section of a rod, and after pulling it through found that it was twenty feet long. Well now the question was, how did it get there? We hunted high and low to find out. No one would tell. And I had detectives go from house to house, and finally they got into a bakeshop, and it seemed that the baker had been using grease on a large scale and it finally stopped up his sewer connection and he used a rod to rod it out and it slipped through one time and lodged at an angle of 45 degrees across the sewer and of course that formed a place for the stoppage of debris and other materials, and it was only a question of regular intervals when the sewer was stopped up, and when they would slide their rods in this accumulation of debris it would be cleared away and the sewer would work all right for a time. These six-inch sewer pipes always have been a source of trouble where they have been used to any extent.

In this respect I want to say that perhaps many of you have not had occasion to know that Colonel Waring introduced this six-inch pipe system into this country and got a patent on it. The records of the city of Croydon, England, contain a history of the construction of a sewer system with twenty miles of pipe, the smallest of which were four inches and the largest fifteen-inch pipe, and they kept a record of the stoppages of that system for three years, and they have published that record, and it discloses the fact that the greater part of all the stoppages was in the six-inch pipes and the four-inch pipes, and they made a report and that report is on record, and in view of the experiences and observations made in the city of Croydon, a suburb of the town of London, they recommended that no sewer pipes be used smaller than nine inches. In England nine-inch pipes are used, and yet in the face of that record of failure the six-inch sewer pipe was used in many cities in this country.

I had a copy of Latham's book on sewerage in 1882. It contained nothing about that case of Croydon. It was republished in this country by the "Engineering News," and through some strange accident this section of the Latham book did not appear, and it was nearly twelve or fifteen years afterwards that I happened to get a copy of the original Latham English publication, and there I found that history dated back to 1852.

It is needless to say that the engineer had his troubles from the very start in connection with this class of construction. Within three years from the original completion of the sewers in the central part of the city, some of them were ordered to be replaced with twelve-inch pipes, to meet the required service. This, of course, is a deviation from the subject of my article but it is necessary by way of explanation in making my brief treatise on house connections, more comprehensible.

In 1892 the writer had occasion to resume charge of public works, including, of course, the sewerage system of the city after an absence of five years and one of his first efforts was to revise the system of sewerage construction including that of house connections. For this purpose, an ordinance was drawn up requiring a permit to be taken out for sewer connection with plans of proposed connection in detail and authorizing the engineer to determine the line and grade of such connection and to test the same by light tests as to alignment and grade. This at first was somewhat difficult but it has become a permanent practice, with very satisfactory results.

In carrying out this work it is well to secure, wherever practicable, a direct line and uniform grade from the house to the sewer and where a straight line is impracticable, a short curve with T section is provided so as to admit of independent light test from the ends of the curve to the terminals of the straight lines. In cases where a number of buildings are sought to be connected from one main connection, manholes are interposed so as to admit of rodding and inspection at any time between the terminals of the straight lines between the house and the sewer. A record is kept in the office showing profiles and the exact location of buildings with names of inspectors, date and condition under which said work was done. This admits of any person who may purchase property years after sewer con-

nections have been made, to ascertain by application at the engineer's office, the location of the sewer and details of its construction.

I will say we have in the city the records of fifteen thousand buildings which have in detail the profiles of the sewer connections, so that if anything happens, a person applying there can find out where the connection is and how to get at it.

I show here a copy of a leaf taken out of our record books which will show you the nature of the case.

Some years ago Mr. Benzenberg, the city engineer of Milwaukee, came up and examined it, and he had a copy made of it and I think has introduced it in the city of Milwaukee, and it has been taken up in other cities.

These changes, of themselves, have been of excellent results and have reduced the number of stoppages in house connections, fully ninety per cent. from what prevailed previously. This practice has been copied in many other cities.

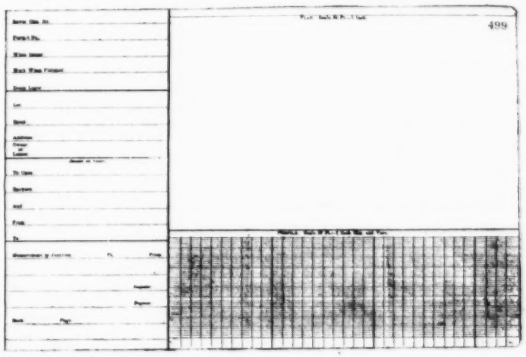
There is one feature still in connection with this form of house connection that is open to improvement. That is the lack of examination and test of the house connections as to the imperviousness of its joints. A large number of improperly constructed joints admit of a steady leakage into the trenches, causing periodical settlement, and, as a result, large numbers of such connections bring about continuous settlement of trenches in the main line of sewers.

I don't know whether any of you have had experience on an extensive scale, but if you have ever tried to run a line of sewer in a swampy country you will find it is almost impossible, under the most careful construction, to run a line of sewer that will not leak, in other words, not take the water from the soil.

I had a case where the pipe was laid in quicksand, and after a time I condemned it because the water came in.

I have thus far only referred to the construction of a plain line of conduit from the house to the sewer. The question of trapping these pipes at some point intermediate between the house and the sewer has often been the subject of debate, but from a very extensive experience and study of the subject, my judgment leads me to the conclusion that an unbroken and continuous connection from the house to the sewer should be laid and extended through to the roof. That the only traps should be those which connect the house fixtures with the soil pipe leading to the sewer.

In other words, I am opposed to the ordinary construction prevalent in the city of catch basins, which are simply a series of cess-pools, waiting to be cleaned by rain storms. The refuse of the street goes into them. It dissolves and it remains there. It is not a septic tank because it does not get time to form a scum on top and create a septic action, so it is nothing more or less than a cess-pool on every corner of the street. Created for what? It may be excusable to have something of that kind in an extremely flat section of country where a large amount of sand is continuously finding its



Reduced copy of a leaf from Omaha's Record-book of sewer connections.

way to the street, and to allow that sand and that kind of material to get into the sewer would cause decomposition and ultimate destruction of the pipes of which the sewer is built. In a great majority of towns where they have good grades, such, for instance, as we have here and in Kansas City, there is no excuse for a basin.

Omaha is perhaps the only city of over one hundred thousand population which has had in successful operation for many years, a system of untrapped connections from the roof to the sewer and from the sewer inlets at the street corner, to the sewer, upon the broad theory that thorough aeration of the sewer through the constant unbroken air currents will give more satisfactory results from a sanitary standpoint.

Now around here in this city, if the weather permits, you can walk along our numerous inlets, at every corner. You may find evaporation and vapor coming up because of high winds and extreme difference of temperature, but you will not experience any odors. But you can go to Kansas City and that is the universal complaint there, that there are strong odors at every street corner. They can be avoided provided they just stop these catch basins and convert them into inlets. In other words,

slope the bottom of the catch basin towards the pipe connection leading to the sewer so that when the sewer is free there is nothing left there to decompose and give off odors. Where sewers are thoroughly ventilated from the man-holes you will not find any offensive odor in going through them. I have walked through many miles of our sewers wearing a pair of rubber boots and could scarcely notice the odor because of the aeration, and if any foul matter stuck to the side of the sewer and decomposed to any extent the enormous amount of aeration that took place so diluted the atmosphere of gases as to render it harmless and innocuous, and the odor hardly noticeable.

You will have occasional sewer odors in cities which arise from entirely different causes than the sewage itself.

I was called into a case in a city in the South some days ago where they had an experience of that kind and they asked for advice as to the cause of these odors in their sewer system. I investigated the matter and came to the same conclusion, that it was not caused by the sewage, but it was caused by the gas company being permitted to connect with the sewer and empty its refuse oils into it; the oils were volatile and the result was that they destroyed the whole sewer system.

We had a little experience of that kind with our gas company in the earlier days, but we compelled them to make a connection from their main works to the river, independent of the sewer, so that we have had a sewer system free from the odors of gas. Years afterwards, at times, they neglected to properly take care of the refuse material and the result was that at certain points in the lower sections of the city, odors came up from the sewer. I was called into the case and traced the trouble to the gas works.

A year or two ago my attention was called to the odor at one of our prominent street corners in the business center of the town. I followed it down a few blocks below and found a man pumping gas refuse into the gutter and from the gutter it ran into the sewer inlet and that was the source of the trouble. I saw the manager and he had the man stop it immediately. There is no occasion in any city to have sewer gases.

In conclusion, whatever the form of house connection system may be used, good practice requires that occasionally flushing of the house connections with concentrated lye or some other solvent of grease which tends to clog the pipe service should be used to keep the pipe clear and free from all decomposing materials.

Combined Steam and Hot Water Radiation

In the Union Trust Building in Providence, a twelve-story office structure, there is installed a system of direct radiation for heating, which may be operated with hot water or steam, at will, from a system of low-pressure steam mains, says "The Engineering Record." If the system is regarded, for the purpose of explanation, at the instant that steam is first admitted, both mains and radiation will be filled with steam. The condensation gradually formed is not, however, allowed ordinarily to pass into the return system until the radiators are entirely filled, and by means of a transmitter, so called, the radiation is thereafter kept full of water so that, except when otherwise desired, the radiation is operated on the hot water system.

Reference to the accompanying illustrations will assist in explaining the apparatus, which is the subject of a patent, held by Messrs. Lynch & Woodward, of Boston, who were the engineers and contractors for the heating installation in this building. In the present case the overhead system of steam distribution is employed, and the radiators, whether of the ordinary type or of groups of coils, are located under the outside windows, and the steam supply pipes are drop lines fed from a system of mains in the attic of the building. The steam supply pipe to each radiator is not, however, connected directly into it, but delivers into the transmitter, from which, in turn, is run the supply pipe to the radiator. The transmitter virtually consists of an enlargement of the drop pipe, constructed of four-inch pipe about two feet long, with special reducing connections at top and bottom for attachment to the drop pipe, as indicated in the sketches. In general, in this building, two radiators are supplied from each drop pipe, and from the top of each transmitter are two openings for the flow pipes to the radiators and at the bottom the two return connections from them. The opening from the transmitter to the continuation of the drop pipe is not made directly from the bottom, but through the top of the group of pipes supported within the transmitter, as shown, one view being the transmitter assembled and the other the transmitter with casing removed.

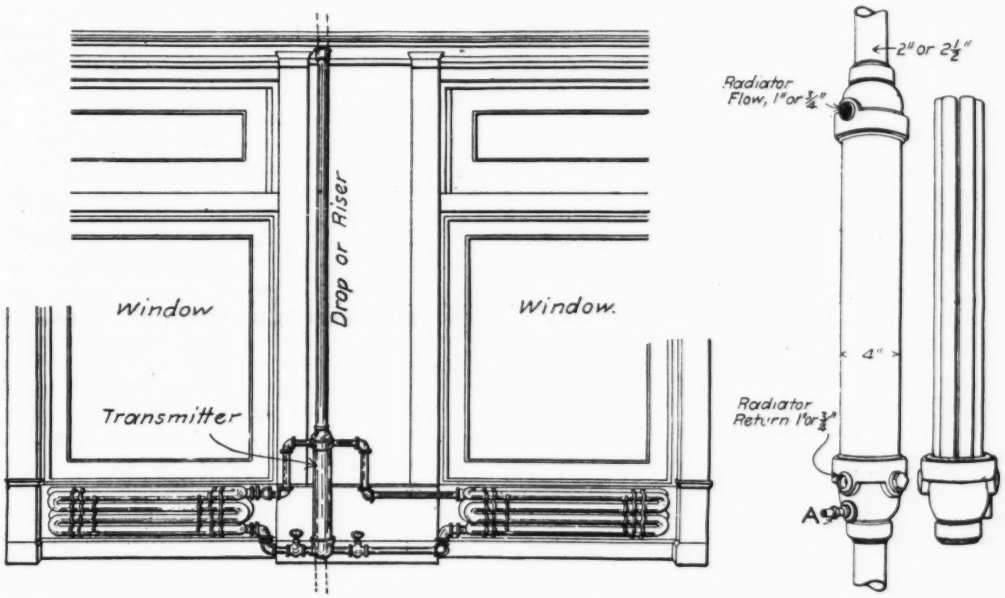
The operation is as follows: Steam admitted in the first place fills the transmitter and can pass from the upper openings into the radiator and entirely fill it. The condensation gradually formed enters the transmitter at the bottom. The water

having no means of egress, rises in the transmitter and, of course, in the radiator, until the tops of the inner group of pipes are reached, when the water will overflow into those pipes and in that way reach the drop pipe continuing from the bottom of the transmitter.

As shown in an accompanying sketch giving the connections for a pair of windows, it will be noted that the transmitter stands higher than the radiators, so that the pressure head of the water in the radiating coils is approximately about one foot. The steam passing through the drop pipe heats the water surrounding the group of tubes in the transmitter, and the water thus heated starts a local circulation from the transmitter through the coils and back again. For regulation one valve only is provided for each radiator, and this is inserted in the return pipe so that the velocity of the circulation can be varied to suit the temperature conditions. It will thus be seen that the system is one providing for hot water radiation with its comparatively low local temperature and capability of regulation for different conditions of the weather and yet without a large volume of water filling the long system of both mains and branches in the tall building.

At the point A, in the sketch of the transmitter, is a valve by which water may be discharged directly from the radiator into the drop pipe. This allows for operating the radiation on steam, and the apparatus is thus equipped by this provision for meeting unusually severe states of the weather, when the hot-water radiation might not prove equal to transmitting the large amount of heat transmission then necessary. In the case of the Union Trust building, a 2½-inch drop pipe supplies the radiation on every one of twelve stories, about 2,000 to 2,400 square feet all told. This gives each transmitter capacity to carry 200 square feet of radiation.

The heating apparatus in the Union Trust building is supplied from two tubular boilers 54 inches in diameter and 13 feet long, that contain 63-inch tubes 12 inches long. They deliver into a 6-inch pipe which is continued vertically through the building to the attic. Here some eleven drop pipes are supplied, for the radiation set around the exterior walls. The bottoms of the drop pipes are connected into a system of return mains which are collected into a 2-inch pipe at the boilers. There are 7,462 square feet of radiation in the building, supplied, as outlined, by a 6-inch steam main and a 2-inch return main. It is stated that only one boiler is required in the severest weather. Data are not at our disposal regarding the performance of an entire winter, but it is said that during the month of January the average daily consumption of coal was less than 1,500 pounds. The heat is kept on the building throughout the 24 hours. This indi-



Hot water radiation supplied by steam main, and the transmitter.

cates a consumption of about one-fifth pound of coal per square foot of radiation per day. The cubic contents of the building amount to 419,000 cubic feet, so that the corresponding daily coal consumption is 3.6 pounds per 1,000 cubic feet. It should be stated that some of the steam is condensed in indirect heating coils in the basement in connection with a blower system of ventilating the banking rooms on the first floor. Briefly, this comprises a 50-inch Sturtevant fan, driven by a direct-connected 3-horsepower motor and the usual heater coil. The motor is a 500-volt direct-current motor of the enclosed type, with field regulation. The ventilating unit is designed to deliver about 3,000 cubic feet of air per minute, and the banking room having 50,000 cubic feet of space, is provided with ventilation at the rate of four changes an hour, if dependence is placed on the fan alone.

Since the foregoing was written, further information has been received concerning the coal consumption of the plant. From October 1 to April 1, 409,090 pounds of coal were burned. One-half of this was No. 3 red-ash buckwheat and one-half New River steam coal. Without considering the fan coil heater, which comprises 1,000 linear feet of 1-inch pipe coils or 345 square feet of surface, 54.8 pounds of coal were burned during the six months per square feet of radiation. The average daily consumption per square foot of direct radiation, based on the six months' experience, was 0.3 pound of coal. The grate surface under each boiler is 20¼ square feet and the heating surface 624 square feet. As one boiler only was used at a time, this means for the average of 2,235 pounds of coal burned per day that 4.6 pounds of coal were burned per square foot of grate per hour, this figure, it must be remembered, being based on the fact that the apparatus is in operation throughout the 24 hours. For one season, that is from October 1 to June 1, 243 days, the average daily coal consumption was 1,740 pounds. This is roughly equivalent to one pound of coal per cubic foot of the building contents over 240 days of an average heating season.

The cost of the heating plant, including the boiler setting, fan, heating and ventilating apparatus complete, was $11,916.

Stretching It Too Far.

"Who discovered the secret of steam?" asked the teacher.

"Aw, say," responded little Johnny, "it ain't fair to keep talking about baseball pitchers this late in the season."—St. Louis Star.

"Hunches" on Hindrances

A FEW REMARKS FOR THE NERVOUS STEAM FITTER.

By Phoenix.

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A long time since a talented man once said, "vaulting ambition which o'erleaped itself and fell on t'other side."

Down east they have it,"to strain at a gate and swallow a saw mill."

Each of these sayings has reference to that mistaken idea of trying to deliver the goods when they are not in stock, and that is the trouble with more than half of the journeymen in the country today.

It begins right at the time he starts out on a job for a new employer.

Watch him hustle up the kit. He is so anxious (apparently) to get busy that he forgets half the tools he needs and the result is that the helper must come back for them. Indeed, the helper will probably make several trips, which will make the boss good and sore and make him suspicious of the fitter at the very start.

He will get the idea in his head that the fitter did not know enough to make out properly a list of tools. I wonder why the fitter never thought far enough ahead to make out, while he was loafing, a complete list of a "kit" of tools and carry it around in his vest pocket? It would save lots of time and trouble and, incidentally, a few jobs here and there.

You see, the fitter wanted to "make good" on the job right at the very start, and so put on an extra boiler pressure of about 70 pounds, which, added to the usual 40 pounds, proved too much for working purposes. It was not normal, deceived no one and the result could be easily foreseen, and ere long the fitter was drawing his "time" at the desk. This same desire to "make good" by crowding the work when under the eye of the boss gets the fitter nervous and rattled and he makes blunders which are both amusing and costly, and work harm to himself when he expected to please.

Be independent and do not go on the keen jump when the boss is either in or out of sight. If he is an old hand at the business he knows very well about how much work ought to show up each day and he can tell very easily when some one is loafing, when he is not "on the job."

One can do about a certain amount of this work in a day on the general average. Now suppose that on the first day everything comes out right and at night the fitter and helper have accomplished twelve hours' work in eight. Well, the foreman may be pleased. That's all right. You have broken your back and made a hit. Then the very next day some of the fittings are shy and the helper has had to make a trip to the shop and several other matters have delayed the game, and at night your day's work really only counts for about three hours. I guess perhaps the boss does not make a few remarks.

Is it not better to keep calm, start out with a speed that can be maintained each day for six months if necessary and give the employer a good, honest, reliable day's work, than to start out with the "ambition" to make a big record?

I have seen fitters so anxious to make speed when the foreman was in sight that they pushed matters until they were so nervous that they could not catch a plain one-inch ell on a pipe at the bench and had to hand it over to the helper to do.

"Such a man was not a fitter," you say. I happen to know better, for I had seen his work. He got rattled by being too anxious to please and tried to accomplish too much.

While speed in this business is highly desirable in certain instances, absolute reliability is much more important.

Suppose that a fitter "crowds things" and puts in a twelve days' job in eight working days. Then the boss has taken the measure of his speed and on the next job the fitter falls down completely and it takes him sixteen days to put in a job where the boss had only allowed for twelve days.

Unless the fitter had worked in the shop before and was acquainted he would, in three cases out of five, be "fired" for using up so much time, and this is what comes of trying to make a "splurge," to dash into the work and try to make your employer believe that you can do two days' work in one and are such a "hustler." Now, I do not object to rapid work, but I say that one should use common sense about it and not start out on a line of action that one cannot back up. Find out your limits and be careful not to exceed them, for as sure as you do trouble is going to camp on your trail.

Speed is all right, but mere speed without any headwork will tire out the best of men on a long job and reduce very greatly the amount of work he can turn out. No man is a mere machine, and it is not natural to work at the highest pressure all the time.

A better plan is to so control one's energy that there is a reserve force upon hand for emergencies, and when the necessity arises this can be drawn upon as the occasion demands. A fitter who has the wisdom to do this will remain calm and collected under very trying circumstances. His head will be level and he will not be completely tired out, and whatever may be the situation he can generally jump in and do what may be required of him at the time.

Such a man will generally know about where his tools may be on the job, and he will know that they are in pretty fair condition. He has had sense enough to keep them so and knows how to do it. He will also have the proper tools upon the job, and he is not afraid to ask for tools enough to do the job with, either, and will resent being supplied with a bum kit and being held responsible for first-class work.

Such a fitter will know better than to loaf on the work and then break his neck making time when the foreman happens along to see how the job is progressing.

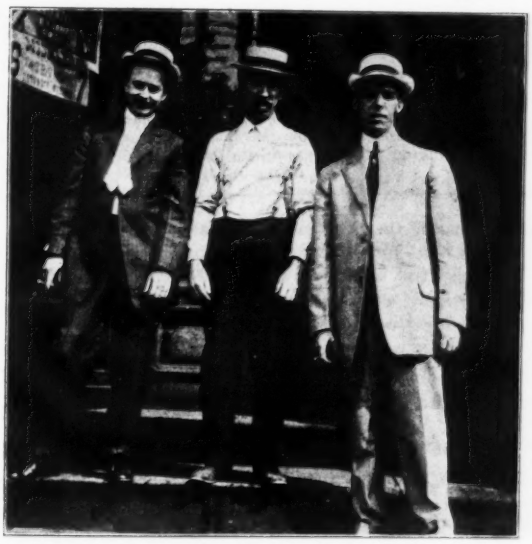
The progressive fitter is not above learning new points in relation to his craft whenever he can see them, and there is always plenty to be learned in the business. People are experimenting all the time and new kinds of apparatus are constantly being brought out, and in order to be in the swim one must keep posted.

A few years ago there were not many books published upon the subject of steam and hot water heating, nor was there much reliable information upon the subject. I can remember when the one-pipe idea in regard to heating by steam first struck that part of the country in which I lived. It was a **fake** they claimed and could never work. "Where would the condensation go?" "How could both steam and water be in the same pipe at the same time?" "The water would prevent the steam from working into the radiator, after the first amount had gotten there," these and many other questions were discussed with much heat. Today we know that the one-pipe system of steam heating **does work** and works mighty well at that, while the two-pipe system is rapidly becoming a thing of the past, and we have now the proposition of vacuum heating upon our hands calling for the best attention and work that all can exert, while hot-water heating has become a specialty of itself, demanding particular attention and experience on the part of the fitter.

Uneven Number.

"Be sure and part my hair evenly," said the old man in the barber's chair.

"I fear that is impossible," replied the tonsorial artist, "as there are just eleven hairs here."—Yonkers Statesman.



A sunny day in Altoona, Pa. Reading from left to right they are: Jas. Kohl, of the Bailey-Farrell Mfg. Co., of Pittsburg; Mr. Trotter, one of the leading master plumbers in Altoona; W. Speakman, of the Union Radiator Company, of Johnstown, Pa. The picture was taken outside of Mr. Trotter's establishment by our Mr. O. T. Carson.

Bringing Men into the Game*

THE MAN-HANDLING POLICY OF A BUSINESS

(Based on an interview given by Richard T. Crane, of Chicago.)

While the chief was away, a new salesman was hired for an important open territory. By house rule, some member of the organization should have been advanced. The requirements of the local situation and the stranger's equipment dove-tailed so perfectly, however, that the exception was made. The fellow had energy and capacity; he knew the business and the trade; he could give affairs the immediate and aggressive handling they demanded. No available man in the field was in his class. Logic assigned the job to him; his success was extraordinary.

Returning, the master's eye singled out the recruit's name—the more quickly since he was making something of an individual record.

"Who is this man?" he asked. "Why was he hired?"

They told him. The business emergency, the outsider's fitness, the dearth of house material—and all the rest.

"You tried no one?"

No one, it was admitted. Engaging the stranger was so plainly an opportunity to add a creative business-getter to the force: observe, indeed, what he had accomplished.

Instantly came the decision.

"Get rid of him. Be fair in settling with him. Help him to a new connection and make it clear why he is leaving us. But get rid of him. **That job belongs to one of our own men.** Who is in line for it?"

There you have definition and illustration of the policy which has built one of the remarkable manufacturing and selling organizations of the country—remarkable for efficiency and individual initiative; for loyalty as evidenced by quality of output, by long service and devotion to the business in time of stress and danger; for vitality, resource and organization spirit—qualities which have rendered the house proof against panics and disasters, made it thrive under one head and one management for more than half a century.

"Civil service rules throughout this company's offices and shops," the president had explained many times. "No stranger is ever to be given the place some one already in our employ can fill. And every-day efficiency is to count as proof of fitness and capacity to administer larger trusts."

An object lesson in continuity of service—a primary article of the Crane code of efficiency: here are forty two employees, gathered from the home offices and shops, who have served the company for periods ranging from twenty-five to forty years. Mr. Crane is in the center of the front rank

This is reciprocal loyalty in operation—the steady job and a chance at the best jobs in the company's gift in exchange for honest, intelligent, unflagging work. It is civil service raised to a higher power—based not on the periodic examinations or routine advancement of government systems, but on efficiency and results. The security of employment and certainty of promotion, the two advantages which tempt thousands of potential producers into sterile government clerkships, are here made the basis of effective business organization.

With what results?

Nine thousand men and more are on the pay rolls. They serve sixteen factories and thirty-eight branches. They make or market ten thousand different products. Their battle line covers the continent. Yet every unit in the army is so identified with the organization, so much at one with the purpose of the house, that last year's record of complaints—the unfailing barometer of efficiency and loyalty—showed only one article in every sixteen thousand defective.

Such results transcend organization and method. They speak of men trained and disciplined to the accuracy of machines: then humanized and energized by evoking in them faith in the company, sense of sharing its responsi-

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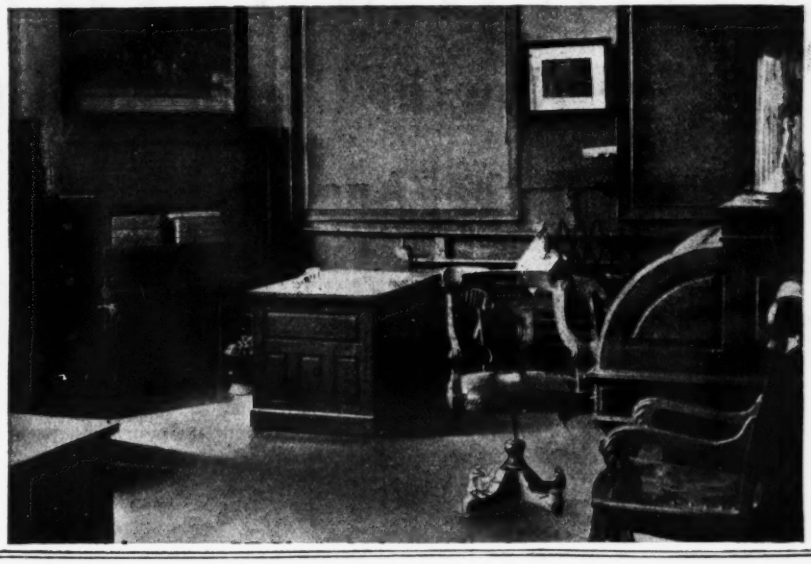
bilities, pride in their individual parts of its work. A practical measure of the same bond is afforded by the fact that, finishing its fiftieth year not long since, the home shops and offices mustered forty-two employees in harness from twenty-five to forty years and several families represented by three generations of workers.

"Every institution," says Emerson, "is the lengthened shadow of a man." The individual behind this 9,000-man-power democracy of business is Richard T. Crane.

"A strong, compact, thoroughly organized working force is the best asset of any business," he declares. "The larger the institution the greater the need of efficient organization of individual initiative, energy, loyalty. Treat the men in the ranks as a factor to be considered equally with the interests of the business itself. Sacrifice a temporary advantage—as in the dismissal of the outside salesman—whenever it conflicts with the eternal task of building up in the force ambition, energy and belief in the company's fairness."

Here is the plan of a great builder; not a mere method of dealing with men, but the success-secret of a big business, the plumb-line by which it was reared.



R. T. Crane's desk in a corner of the huge open office where the company's business is focused. The desk, the gift of employees, has been in use thirty-five years; it serves as a meeting place for his cabinet of advisors when discussing the "human material reports" on which advances are based

The Vital Factor of an Efficient Organization—Care in Recruiting to the Ranks.

"Get efficiency: get loyalty: get continuity of service," Mr. Crane commands.

"Beginning right, looking first of all for character and quality in our raw material," he explains, "it has been merely a study in details to bring our organization to its present highly efficient state. Mistakes in filling important positions have been rare, because few mistakes have been made in recruiting to our ranks."

The laboratory tests which prove the steel, brass and coal entering the company's yards are duplicated in a way by the inspection each employee undergoes before he is hired. For mechanics and laborers, the physical examination and scrutiny of references and conditions surrounding their employment, are more severe than the average.

On the boys who are hired, the employment bureau concentrates particular attention. "Getting the right boy is the basis of our organization," Mr. Crane explains. "If we hire the wrong boy at the start we waste our training on a drone or ultimately, advancing him, get a bad executive. Our study is to catch them young, to train them in our methods and purposes, to develop their individuality, to teach them how to work and think in our way.

Little is demanded of the youthful applicant save that he be unspoiled raw material—the rawer the better. He must come of respectable parents; his reputation must be free of vice, meanness and dishonesty; he must be sixteen years of age; his health must be good and he must be familiar with "the three R's." A common school education is the most that Mr. Crane asks or desires.

Character and capacity are tested in a strict school. If the boy falls below the standard in energy, honesty, intelligence or obedience, he is weeded out and another probationer takes his place. Once accepted, however, the boy enters a channel of civil service that is maintained rigidly—as rigidly as the instance of the outside salesman would indicate. Every chance of promotion belongs to the men in the organiation unless the exigency requires a specialist.

Securing efficiency—once capacity has been demonstrated—is a matter of training. The Crane idea of training is the development of understudies, the grounding of an assistant in the duties and the policies of rules governing the actions of every executive. Each man whose work requires special knowledge has an understudy ready to assume his place should he drop out. This does more than keep executives "in line" and provide against emergencies: it develops the brain power, the vision and the interest in the business of every member of the organization.

"I insist," says Mr. Crane, "that department heads

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and bossess train men below them to intimate familiarity with the duties of their offices. I will not have a man who is over-important. I do not want one who can't go away for six months, if necessary, without injury to the business.

"For instance, one of our department men had not taken a vacation in several years. When the fact came to my notice I asked him why. He had been very busy, he said, and hadn't seen the opportunity. 'I'll see that you get it,' I told him. He went on a vacation. In his absence, the weakness of his department, of his methods, was laid bare and he lost his position.

"My idea is that an executive should surround himself with understudies sufficiently trained and in touch with affairs to carry on the business when he is absent. The man is a failure who hasn't the courage and ability to choose strong men as his aids and to train them to take his place. The ability to pick competent understudies and to develop them is one test of the executive. With the raw material furnished him, failure is proof of his own incompetence. The increased pay rolls I regard as an investment.

"Better for a company to spend thousands of dollars every year in holding surplus material, and ability in the shape of understudies, than to be so weak in organization that when one man drops out the business suffers. The mistakes our house-trained executives avoid more than pay their extra salaries as understudies."

Training of the understudy, however, is not left to the judgment or whim of his immediate chief. For the instruction and guidance of employees, Mr. Crane has evolved an extraordinary system of rules, the latest numbered around 5200.

These rules embody the crystallized experience of the company's half century—literally a text-book of the business and a comprehensive code covering all its features. They range from the broadest points of making and selling policy down to the width of letter margins or the size of "risers" on steel castings. They are all specific—incisive, clean-cut commands, forbidding a certain practice or defining an operation.

"Rules are the permanent orders by which the head of a concern is enabled to direct the operations of his subordinates, however numerous or widely scattered." Thus Mr. Crane interprets his code. "They fix the scope of each department and hold all departments to unity of action, singleness of purpose and frictionless co-operation.

"I remember discussing this subject once with the head of a large establishment. He asserted that his business was conducted entirely without rules and that he would not have a man who could not run his department without such help.

"What he meant, of course, was that he gave verbal instructions to his principal employees and that each department manager in turn gave his assistants such instructions as he deemed necessary. Now it seems to me that department managers should receive more than mere off-hand instructions, which are easily misunderstood and quickly forgotten. The man at the head of a business ought to know the best way to conduct it. He should

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not leave to subordinates the making of rules for themselves and their assistants.

"Whenever an error has occurred, repetition of which might be prevented by issuance of a rule," Mr. Crane continued, "the rule has been issued." Mistakes, indeed, have been the inspiration of many of these "permanent orders." It is necessary for executives and employees to experiment and make errors, the company concedes: but there is no reason for experiment or error when the best way has been already determined. Therefore the rule-book—to put the employee in possession of the proved knowledge and methods the company discovers and cut out unnecessary mistakes.

How the Rules Enforced Have Become Habits.

Thousands of the rules are now unconscious habits of the employees they concern. For the new employee or the executive-in-training they are the simplest, clearest, most comprehensive summary of the things he must do, the other things he must avoid. Not all the rules go to all executives: only those which concern his department in its work or its relations with other departments. The head or his understudy seldom has to ask a question; the rules cover almost every contingency that can occur. Instead of filtering the company's policies or desires through three or four personalities, each modifying the first intent, there is a crisp definition of what is to be done, and how, to the man who does the work.

A well-rounded course in efficiency this! No excuse for the boss who makes an error which has been caught before and tabulated. And therefore few errors of this class. The new rules also make for efficiency by dragging current offenses against the policy of the company or its code of ethics into the limelight. A careless letter, or a delayed order, has caused a customer annoyance or loss, perhaps endangered a contract. Instead of a lecture on carelessness, comes a new rule: and the error is not duplicated.

"Small things done wrong grow into big ones," is Mr. Crane's way of expressing it. "I have tried to correct the universal tendency to inaccuracy. The aim of my rules is to build up clean-cut workers. I want men who know the right way to do a thing and do it that way—completely, effectively, but with the least labor."

"Development classes" are conducted to fit both boys and men for advancement. Natural intelligence frequently wins a shop job for a youngster with little schooling. To remove this handicap, night classes instruct the backward youths in "the three R's." Another class gives packers, truckers and other storeroom men instruction and practice in filling orders, figuring prices and making out invoices.

(To be continued.)

While the Polar War Is On.

"Omit, if you please, the first verse of the hymn," said the minister.

The congregation looked surprised.

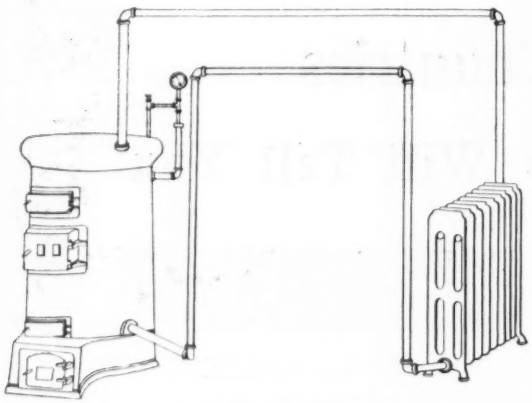
"It mentions Greenland's icy mountains," explained the minister. "We cannot afford to introduce into this peaceful gathering the subject likely to lead to acrimonious debate."—Philadelphia Public Ledger.

Questions and Answers

This department is maintained for the use of every reader of "Domestic Engineering." We solicit problems from you and will give them our best attention. In stating your questions please give all of the facts as clearly as possible and when necessary accompany your question with a correct Layout of the job.

WILL THIS HEATING JOB WORK?

285.—Warrensburg, Mo.—To the Editor of "Domestic Engineering: Sir: I enclose herewith the plan for the installation of a hot water heating plant for a storeroom 25x100 feet, 12 feet high, with a glass surface of 10x25 feet and one door 6x9 feet. Do you think that a plant installed in accordance with this plan will work right? If so, how large should the boiler be



Sketch of proposed heating plant, submitted by M. O., of Warrensburg, Mo.

and how much radiation will it require? The flow enters the radiator at the top and leaves it at the bottom at the opposite end. The floor is concrete and the pipes must be run as shown on the plant. An early answer will please, yours, **M. O.**

The amount of information conveyed in this letter is somewhat vague. For instance, nothing is said about the amount of exposed wall, glass surface, nor how the building is constructed and exposed, therefore we shall have to guess somewhat in our answer.

We have in this room, from the dimensions given, some 30,000 cubic feet of space and that is all we know about it from the data forwarded.

Generally speaking, in the climate of Missouri, about 900 feet of radiation (hot water) should heat this room, but I desire to state that there might be many circumstances which might obtain which would call for either more or less radiation, according to the case. We should be inclined to use a boiler which was rated to carry some 1,200 feet of radiation.

This would call for about a 25-inch grate. We believe that a boiler of this size would give more satisfactory results than one just large enough to carry the desired radiation, whatever it might amount to as figured up when all the conditions were known.

In relation to the concrete floor the writer desires to state that he never yet saw one that he could not go through or under and fails to see the reason for running the return pipe around the door as per the sketch.

Unless a pressure apparatus were used upon this job, and with no more height than could be gained in that store room, the writer would be inclined to question the proper working of the job as given in the sketch.

HOW CAN THE TRAPS BE KEPT FULL?

276.—Warren, Pa.—To the Editor of "Domestic Engineering." Sir: What means can I take to keep the traps in a building from passing foul air when the building is out of use and the water service cut off?

S.

In the summer time if the traps had been left full, the water probably would evaporate, unless some one made regular trips and filled them, which would of course be too tedious.

If the traps were left full of water in the winter season in an unoccupied building, they would probably freeze and require repairs.

To avoid this the plumber generally fills the traps with some heavy oil that will not dry out very rapidly.

Just before the tenants move in, this oil should be removed and not allowed to pass into the sewer, and it is then a good plan to clean the traps out by running through them a quantity of hot water containing a strong solution of common soda.

HOW MUCH COAL IS CONSUMED?

277.—Strasburg, Va.—To the Editor of "Domestic Engineering." Sir: Kindly give me the difference in consumption of coal or fuel in hot air, low pressure steam and hot water heating.. **O. P. S.**

In relation to the question of the difference of coal consumption asked for in the foregoing question, the writer will give the results of his own experiences and observations, which are drawn from various sections of the country. In many cases I have pulled out hot air furnaces and put in steam jobs that did not burn half the amount of coal. I want to state that I never yet saw a hot air furnace that would do the same work as a steam or hot water job on the same amount (or less) of fuel. I should judge that on a general average a hot air furnace would burn at least 50 per cent more fuel than either steam or hot water in the same sized building. With regard to the difference existing between steam and hot water, I can say that jobs differ and also the people who are running them. Many good heating men claim that steam will use less fuel, while others equally certain are sure that hot water will use a smaller amount of fuel. Then along comes the vacuum steam specialist, who claims that he can heat a building on less than either hot water or the plain gravity system.

My own observation teaches me that certain classes of jobs are suited to certain classes of buildings. Now, the right job in the right building will of course be perfection, but if a system is installed which does not meet the necessities of the occasion it could not help but be unsatisfactory.

The thing is, therefore, to be able to tell which system is best, and that is found out by experience, observation and reading both books and the trade paper.

WHICH KIND OF PIPE SHALL BE USED?

282.—Du Bois, Pa.—To the Editor of "Domestic Engineering." Sir: Kindly give me your opinion regarding what kind of pipe is considered by the trade the most practical to use for waste for a washstand or two washstands. As for instance, where on the first floor there is one and directly above it another, whether 1½-inch galvanized pipe with recess fittings or 2-inch extra heavy soil pipe. Which makes the most practical and satisfactory job?

Awaiting this information, I am, yours truly, **E. W.**

One of the authorities upon the installation of plumbing systems says: "There is no difference in the principles of construction between the Durham system (to which we presume our correspondent alludes when he mentions recessed fittings and galvanized iron pipe) and the plumbing system as ordinarily constructed." On the Durham system no caulked lead joints are used. It is argued that the use of recessed fittings gives a more perfect alignment and that by using pipe which screws into the fittings a stronger job is obtained.

On the other hand, those who are in favor of using caulked joints and cast iron pipe claim that if the work is properly supported it will never pull apart, and that the wrought iron pipe will not last nearly as long as the cast iron pipe does, while steel pipe has a shorter life than wrought iron. It is claimed that wherever a thread is exposed the corrosive action gets to its work and that trouble may be expected at this point. Perhaps some of our readers may have data they would like to offer upon either side of this question, which is of so much importance.

WHY DOES THIS RANGE BOILER HAMMER?

283.—Flemington, N. J.—To the Editor of "Domestic Engineering." Sir: Please send us information in regard to water hammer in a range boiler. This is a steel boiler of 102 gallons, the grading of the pipes is right and also water backs. This boiler will snap and crack when it is apparently cold and when there is a hot fire on, but as soon as coal is put on the fire it seems to stop. Turning the hot water faucet in sink will not relieve it. **F.**

This is a rather curious combination of affairs and without any sketches we are somewhat at a loss to prescribe for the case. We are inclined to think, however, that the key is found when you state that when coal is thrown upon the fire the snapping and pounding seem to stop. Now follow out this hint. When coal is thrown upon the fire it naturally, for a time, holds things down. This would stop the waterback from generating steam, which, we think, may be the cause of the noise. You say the waterback is all right and also the pipes. Possibly air may accumulate in the pipes or tank. We should be pleased to make a more definite reply should these suggestions not work and would request that a sketch be forwarded.

If you are not absolutely sure of the piping we should advise looking it over, as there may be a stoppage at some point, which would retard the circulation.

GARBAGE BURNERS.

281.—St. Louis, Mo.—To the Editor of "Domestic Engineering." Sir: Is there any way in which the heat from a garbage burner for a big building can be made to serve some useful purpose? **O.**

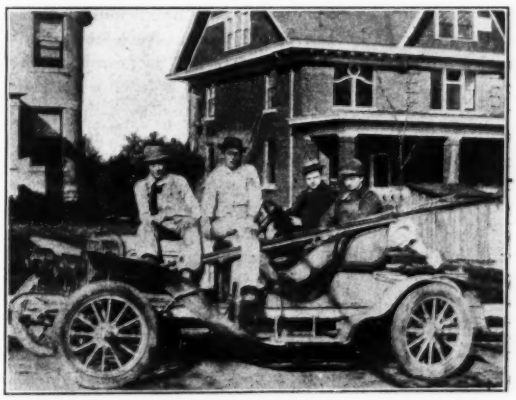
In some places there are installed what is known as garbage water heaters. These heaters have two grates. The first grate is placed the same as in any ordinary heater and coal or wood may be burned upon it. The second grate is located about 18 inches or twenty-four inches above grate number one and is formed of a coil through which the water circulates. The garbage may be placed upon this second grate and burned. It has been stated that where there is a large amount of garbage to be disposed of this apparatus is economical and satisfactory.

WHAT IS A GOOD LIGHT FOR A COUNTRY TOWN?

279.—Macon, Ga.—To the Editor of "Domestic Engineering." Sir: What is a good light for a plumber to handle in a country town? Something reliable and efficient and at the same time not too expensive.

The town I have reference to is not Macon, and it does not possess a gas plant. Perhaps some of your readers may have some suggestions to offer. Yours truly, **J.**

We would suggest that the writer of the above communication send for circulars of several good lighting systems, in which gasoline or acetylene gas is used for the purpose of furnishing light, and get discounts upon the apparatus. He will then be in shape to figure actual costs and ascertain first hand just how much each kind of apparatus costs.



"On the way to the job." This is Edward Jacobs, a successful plumber and heating contractor, of Cincinnati, O., with three of his men on their way to work. In this case they are headed for Col. Shott's new residence in that city, the plumbing and heating of which were awarded to Mr. Jacobs. The auto-wagon, as Mr. Jacobs styles it, is also used to carry supplies, as will be seen in the picture, and he says it is a success for this purpose.

WHOLESALE PLUMBING AND HEATING NEWS

Frank H. Cullen sells his interest in the Union Manufacturing and Supply Company, of Pittsburgh, Pa.

Crane Company resumes building operations on its new plant at Oakmont, Pa.

FRANK H. CULLEN RETIRES FROM UNION MFG. AND SUPPLY COMPANY.

Frank H. Cullen, president and general manager of the Union Manufacturing and Supply Company, of Pittsburgh, Pa., has sold his interest in that company to M. A. Sisk and William Y. English, both well known in plumbing supply circles in Pittsburgh. Mr. Cullen will retire from the business as soon as the minor details can be arranged. He was the organizer of the company and has been the principal owner since it started in business. He has not yet announced his plans for the future. M. A. Sisk will be the new president of the company. He has for some years been auditor of the Duquesne Sanitary Company, of Pittsburgh, and he has the reputation of being a most capable business man. William Y. English, who becomes secretary of the company, has for some time past been secretary of the Geo. H. Soffel Company, one of the leading plumbing firms in Pittsburgh and vicinity. He is fully conversant with all branches of the plumbing and plumbing supply business from start to finish. Frank H. Cousley will continue as treasurer of the company and have charge of its financial affairs as in the past. He has been connected with the company for several years and is familiar with all details of its business, which makes him a valuable man to retain. The negotiations for the transfer of the holdings to the new owners have been under way for some time, and frequent rumors of the pending sale have been heard from time to time, but nevertheless, the consummation of the deal will be a surprise to many interested in and allied with the plumbing supply and plumbing contracting business. The official announcement was made last week. The company is being reorganized at the present time, and the name will be changed, to become effective on January 1, next, when the new management will be in absolute charge of the business. This new name has not been positively decided upon yet, and an announcement will be made later with this information as a nucleus. The business of the company will continue at the present location, Liberty avenue and Twelfth street.

ANNUAL MEETING OF METAL WORKERS' CLUB.

The Metal Workers' Club held its annual meeting at the Hotel Astor in New York City on Wednesday, December 8. Jos. H. Glauber, the president of the Club, delivered an exceedingly interesting address, in which he covered the history of the year from a brass worker's standpoint in a most thorough manner.

THE ILLINOIS CHAPTER'S DECEMBER MEETING.

The Illinois Chapter of the American Society of Heating and Ventilating Engineers will hold its regular monthly meeting on Monday evening, December 13th, in the private dining room in the College Inn, at 124 South Clark street, Chicago. The supper will be served at 6:30 o'clock.

CRANE COMPANY RESUMES BUILDING OPERATIONS AT OAKMONT, PA., AND BEST MANUFACTURING CO. STARTS WORK ON NEW ADDITIONS.

Work on the immense new plant at Oakmont, Pa., that was started about a year ago by the Crane-Best Company, a consolidation of the interests of the Crane Company, of Chicago, and the Best Manufacturing Company, of Pittsburgh, is again going on. However, the announcement was made public last week that the affiliations that had been formed between the two well known concerns have been severed, and that the construction of the plant will be completed by the Crane Company, which concern will own and operate the plant when it has been completed, some time next spring. Work had been progressing for about a year, the understanding being that the plant would be operated by the newly formed consolidation, when suddenly work was stopped, and the officials of the Crane Company who had been located here were summoned back to the general offices in Chicago. Simultaneous with the announcement of the Crane Company that it would operate the plant, came the announcement from the Best Manufacturing Company that contracts had been awarded for the erection of two large additions to its plants. One of these additions will be at the machine shop, at Twenty-fifth street and the Allegheny Valley railroad, in Pittsburgh. This building will be of steel frame and iron clad construction, one story in height, and will be 280 feet long by 73 feet wide. The other building will be at the company's foundry department at Thirty-fourth street and the Pittsburgh Junction railroad. It will also be of steel frame and iron clad construction, and will cover a ground area 60 by 100 feet. The two additions, exclusive of interior and mechanical equipment, will cost in the neighborhood of $50,000, and will be rushed to completion.

ROCOCO BOILER CO. BUILDS NEW PLANT.

The Rococo Boiler Company, of Erie, Pa., which some time ago purchased the business of the American Heater Mfg. Company at West Chicago, Ill., is erecting a new plant which is nearing completion.

TO MAKE HEATING SPECIALTIES.

The Vapor-Vacuum Heating Company, of Camden, N. J., has been incorporated with a capital of $125,000 to manufacture heating specialties. The incorporators

are A. M. Garrison, George S. Yerkes and Amos S. Flowers.

MODERN SCIENCE CLUB'S LECTURES.

Secretary James A. Donnelly, of the Modern Science Club of 125 South Elliott place, Brooklyn, N. Y., has announced the following lectures to be delivered at the club house on the five Tuesday evenings of this month. Also a special meeting: December 7, Prof. A. G. Koenig on "Refrigeration," with stereopticon views; December 14, "Heating and Ventilating by Warm-Air Furnace," by P. H. McCarthy, official lecturer of the General Furnace League; December 16, a special meeting of the club will be held on this evening, also a special meeting of the Board of Directors; December 21, "Surface Condensers" will be the subject of Geo. A. Orrak; December 28, Arthur Ritter, of the American Blower Company, will lecture on "Blower Equipment and Systems." At the last quarterly meeting of the club it was decided to set Thursday evenings aside for general social evenings, informal discussions, etc.

THE METAL MARKET

A VIEW OF THE COPPER SITUATION.

New York, N. Y.—A representative of one of the largest international selling agencies in copper is quoted as follows: "Owing to the fact that all of the principal selling agencies are sold so well ahead, there is but little business now doing among first hands. The result is that dealers and second hands are making the market. The United Metals Selling Company, Phelps, Dodge & Company, the Guggenheims and, in fact, all of the first hands which were large sellers on the advance in the metal up to 13¾ cents a pound, are still adhering to that price. But there are no sales being made by them as the American manufacturers are well supplied for some time to come. Small dealers, however, have some small stocks, and wherever possible they effect a sale at 13⅜ cents a pound. The advance in copper metal to 13¾ cents accompanied the copper merger talk. The situation would have been better had the market worked up more gradually on buying actuated by the belief that the metal was cheap at 13 cents. Had this course been adopted there would probably be good buying orders in the market now at 13¾ cents.

LULL IN PIG IRON BUYING.

Cleveland, O.—The iron trade approaches the end of the year with a continuance of record-breaking production of furnaces and mills, and heavy specifying against contracts which expire January 1, but there is a distinct lull in pig iron buying, with soft spots developing, especially in the south and the Ironton district, says "The Iron Trade Review." Statistics of coke and anthracite iron production for November show a total of 2,532,056 tons, and the average daily production for November was 84,402 tons, compared with 83,358 tons in October. The merchant furnaces produced 18,897 more tons in November than in October, while the output of the nonmerchant furnaces shows a decrease of 80,111 tons. Another of the Gary blast furnaces has become operative, making six now in the active list. The pig iron market has been characterized by dullness in all parts of the country, and in the south sales are being made for prompt delivery at $14.00, Birmingham, for No. 2, and $14.50 for first half of next year. These quotations are now made by some furnace interests as well as by brokers. Quotations in the Ironton district are being shaded, but, for the most part, the strength of the pig iron market in the north is being well maintained, and a large number of important interests are adhering rigidly to recent quotations.

NEW YORK METAL MARKET, DECEMBER 7.

Copper, Prime Lake	$13.50
Copper, Electrolytic	13.40
Lead	4.40
Spelter	6.37½
Antimony, Cooksons	8.37½
Straits Tin	31.91

CHICAGO IRON MARKET, DECEMBER 9.

Lake Superior Charcoal	$19.50- $20.00
Southern, No. 2 Foundry	18.85- 19.35
Northern, No. 2 Foundry	19.00- 19.50

December 9, 1909.

Foundry Iron was the same as the week previous.
$2 more a ton than year previous.
Copper was ½ cent more a lb. than month previous.
the same price as the year previous.

CHICAGO OLD METAL MARKET.

Dealers buying prices are as follows:

Clean heavy copper and wire	12.50
Light copper	11.25
Heavy composition	12.00
Heavy yellow brass	7.00
Light brass	7.25
Heavy lead	4.00
Tea lead	3.65
Block tin pipe	28.00

Interior view of the up-to-date plumbing establishment of S. C. Brown & Company, at 115 West 17th street, Los Angeles, Cal. The gentleman in the picture is Sam (Buster) Brown, junior member of this prosperous firm. The photograph was secured by our Mr. E. De Forest Winslow on his recent journey to that part of the country.

ASSOCIATION NEWS

MANHATTAN PLUMBERS' ANNUAL BALL.

New York, N. Y.—It is wonderful how much pleasure and enjoyment there can be crowded into the comparatively short space of one evening, and, of course, a small portion of the next morning. Any one doubting this statement should just don a set of his fancy arrayment and attend one of those balls given by the Manhatten Master Plumbers. The grand ball room of Terrace Garden on Fifty-eighth street was bedecked in the most gorgeous decorations, the ladies resplendent in their prettiest costumes. Such was the scene at the garden on Wednesday evening, December 1, when the Manhattan branch of the Master Plumbers' Association held its annual entertainment and ball.

The plumbers spared neither themselves nor their neighbors in a grand effort to make the event a success, greater than all its predecessors. Needless to say, their fondest hopes were realized. The entertainment that divided the honors of the evening with Professor Eben, who, with two of his best orchestras, furnished the music for the dancing, was a treat seldom if ever enjoyed outside of Herr Hammerstein's at two bills per copy. It was composed of Broadway's cleverest stars, who for upward of three hours kept the audience in laughter and earned hearty applause.

After an instructive exhibition of the peculiarities of the "love microbe" and a course of "farmology" by the Vitigraph, the long-shoremen removed the settees and cleared the floor for the grand march and some two dozen dances that followed. Right here is where the real enjoyment of the evening commenced. Those more strenuously inclined held the floor for dance after dance and whirled like the stock market, while the intermissions for recuperation were spent in the cafes.

The genial Fred Howe was very much in evidence, as usual, with a plentiful supply of his Beaver stories. Nothing could keep Fred home from one of these affairs, short of an 88-caliber blizzard, and even then he'd get out his shovel.

National President Walter D. Nolan was enticed by the committee's invitation to journey up from Washington, and National Vice-President A. Selden Walker graced the scene, as did Mrs. Walker. Other out-of-town guests noticed were National Secretary Samuel Artz, of Washington; Frank F. Schimpf, of Albany; James Meeks, president of the Brooklyn branch; Joseph Theiss and President William J. Flynn, of the Bronx. M. Meahney, president of Journeymen's Union No. 498, and James Higgins, president of Local No. 480, were also present.

It was well into the morning when this pleasant event had its finale and the taxi pilots saved headlight expense in taking the last of the merry party home. Indeed some of them may still be on their way. George Larson was very much overdue; this, George explained, was due to the dusty roads, lack of gasoline, poor crops and the Nicaraguan situation. Be that as it may, everyone fortunate enough to be present gave a hearty vote of thanks to the entertainment committee and reluctantly left, even when the strains of "Home, Sweet Home" put the hall in darkness.

The committee responsible for the arrangement of the evening's enjoyment was composed of T. A. Hill, chairman; T. S. Cochrane, Jr., secretary; I. J. Brown, treasurer; T. J. Tuomey, Geo. H. Creasy, F. B. Lasette, J. L. Murphy, Cuno Muller, B. F. Donohoe, T. J. Cummins and Jas. P. Knight.

PATERSON PLUMBERS' LADIES' NIGHT.

Paterson, N. J.—The Master Plumbers, of this city, held a ladies' night social on Thanksgiving eve. The members and their wives and sweethearts were entertained at the Empire theatre performance, after which the party adjourned to Carlson's, where a banquet was served.

ST. LOUIS PLUMBERS GIVE GRAND BALL.

St. Louis, Mo.—The thirty-sixth annual ball of the Master Plumbers' Association of this city was held in Trimp's Hall, at 4456 Delmar boulevard, on Tuesday evening, November 30. Master plumbers, their wives and sweethearts to the number of several hundred participated in this, the largest social function ever undertaken by the association. A program of dances, solos and electrical displays was carried out. The electrical features were elaborate and spectacular. And they all came as surprises. At the fourth dance the lights were dimmed and from every corner of the house came the whistling of mocking birds. This was effected by electric water whistles. At the ninth dance, while the orchestra played the "Glow Worm," the lights were turned out and vari-colored serpentines gleamed all over the hall. The eleventh dance was accompanied by electric "shadowgraphs," the fourteenth by silver-toned electric bells, the fifteenth by a reproduction of a thunderstorm and the eighteenth by the flashing of spot lights. Every one of these special numbers was encored. The committee on arrangements cannot be given too much praise for the excellent manner in which it performed its task. It consisted of the following gentlemen: Louis F. Abel, chairman; Henry Moore, David Cunningham, Joseph Ries, Alfred Kiel and William K. Mykins.

SPROULES A HAPPY APPOINTMENT.

Jersey City, N. J.—The members of the local association of Master Plumbers are very much elated upon the recent appointment of their president, Jos. A. Sproules, to serve as a member of the Legislative Committee of the State Association. Mr. Sproules is well fitted for this position on account of his long connection with the Jersey City Board of Health. His good work as a member of that board is well remembered by every member of the craft in this city. It was he that laid the foundation for, and pushed to a successful realization, the first plumbing code of the city, by which the craft is now guided. Mr. Sproules is well acquainted with conditions in the trade throughout the state and his appointment on the above committee will be a source of satisfaction to all concerned.

CONVENTION DATES.

January 18, 19 and 20, 1910.—Sixteenth annual meeting of the **American Society of Heating and Ventilating Engineers,** in New York City. The sessions will be held in Engineering Societies building, 29 West 39th street.

January 20, 21 and 22, 1910.—Fifth annual meeting of the **American Society of Inspectors of Plumbing** and **Sanitary Engineers,** at Trenton, N. J.

January 26 and 27, 1910.—Annual convention of the

Illinois Master Plumbers' Association, at Springfield, Ill. Headquarters at the Annex of the St. Nicholas Hotel.

March 7 and 8, 1910.—Annual convention of the **Kansas State Association of Master Plumbers,** at Kansas City, Kans.. Headquarters at the Grund Hotel.

March 8 and 9, 1910.—Annual convention of **New York State Association of Master Plumbers,** in New York City.

PLUMBING LEGISLATION

AKRON INTERESTED IN CLEVELAND PLUMBING CODE.

Akron, Ohio.—Plumbing Inspector W. S. Voris is making an earnest effort to have the city council adopt the Cleveland plumbing code. The Master Plumbers' Association and the Chamber of Commerce are at present studying this code with a view of endorsing it or file objections to it with the city council.

HARRISBURG, PA., TO HAVE PLUMBING INSPECTOR.

Harrisburg, Pa.—The postponed ordinance creating the office of plumbing inspector was called up and passed at last week's meeting of the city council. It is now in the mayor's hands waiting his signature. . The ordinance provides for the appointment of a plumbing inspector and fixes his compensation at $1,500 a year. If the mayor signs it, the new ordinance will become effective April 1, 1910, and the council must provide for the expense in the budget now being prepared.

PERSONAL MENTION

Geo. W. Fleming, of the Pittsburgh Gage & Supply Company, Pittsburgh, Pa., was in Chicago this week visiting the trade.

W. R. Goodwin, president of the Never Split Seat Company, of Evansville, Ind., was in Chicago this week and called on some of his friends in the trade.

T. J. Nagle, of the Hays Mfg. Company, of Erie, Pa., was in Chicago this week calling on the trade. He reported business good for this season of the year.

Harrison P. Eddy, of the firm of Metcalf & Eddy, of Boston, has been appointed a member of the commission of experts to advise the city of Milwaukee, Wis., regarding its sewerage system.

Thos. J. Hester has severed his connection with Jas. B. Clow & Sons, of Chicago, to accept a position with the Harrison Engineering Company, of 42 East Twenty-third street, New York City.

Denver, Col.—E. L. Coombs has moved his plumbing establishment from 3449 Clyde place to 3123 Boulevard F. Moody & Hood have moved their plumbing business from 2931 West Twenty-fifth avenue to their own building at 2524 Boulevard F. Robert M. Street has moved his plumbing establishment from 1816 Welton street to 35 Boulevard F. If this boulevard gets a few more plumbing establishments it will no doubt soon be known as "Plumbers' Row."

The Pay of a Capable Chief Sanitary Inspector

(Concluded from page 269)

officer of the city in enforcing the ordinances already in existence, he has always been ready to forward in every way possible the improvement of our ordinances by new drafts and amendments. We have been fortunate in securing the advantage of his ripe judgment and careful training, which were foreshadowed by the results obtained by him in similar departments in the city of Washington, D. C., and The Tenement House Department of the New York City administration, and as secretary of the City Homes' Association of this city. The fact that Mr. Ball is looked upon as a leading sanitary engineer is shown by the fact that his technical associates throughout the nation have elevated him to the presidency of the American Society of Inspectors of Plumbing and Sanitary Engineers.

All of the foregoing is very lovely reading to the city of Chicago and to Mr. Ball's friends, but it is very much to our shame that this city is not paying its Chief Sanitary Inspector one-half of the wages he could earn in private practice or by accepting a similar position in other cities. Many will read these lines with surprise when they learn that the present salary of our capable and efficient Chief Sanitary Inspector is but $2,500. It is absurdly small, and when this salary is compared with those received by other chiefs in other departments of the city's government, in which technical training and engineering knowledge are not required, it will be seen at once how painfully inadequate is the recognition of the growth of our sanitary department. The committee of the Common Council charged with recommending appropriations is now at work and it is earnestly hoped that they will recognize the importance of this position, and not only secure for Mr. Ball a salary which is somewhat commensurate with his abilities, but that they will attach to the position of Chief Sanitary Inspector a salary that in the future will attract men of like attainments when it becomes necessary to have a new incumbent in the position, which speaking for many persons and representing many interests, I sincerely trust will be many years distant.

Jno. K. Allen.

PLUMBING INSPECTION

LITTLE ROCK TO HAVE A PLUMBING INSPECTOR.

Little Rock, Ark.—The plumbers in this city are greatly interested in the announcement that the city council will take up Acting Mayor Tuohey's ordinance for the establishment of the office of plumbing inspection. The ordinance reads in part as follows: "The plumbing inspector is empowered to examine and inspect all plumbing hereafter installed within the city of Little Rock and whenever such plumbing shall be found defective it shall be the duty of the owner, agent or lessee of such building to place the same in a proper sanitary condition after reasonable notice from the Board of Health. The plumbing inspector must be notified when work is ready for inspection and test and must examine and approve or

reject all work not less than sixteen working hours from the time of such notification. All work shall be left uncovered for examination until the test is made and the work approved by the inspector." The ordinance further provides that the plumbing inspector must approve all permits for plumbing or house drains before such permits are issued by the city collector. It also fixes the fees for such permits and lays down a number of rules for plumbing which are to be enforced by the plumbing inspector.

PLUMBING INSPECTORS' MEETING PLACE SELECTED.

Trenton, N. J.—The Republican Club Auditorium has been secured by the Trenton Arrangements Committee for holding the annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, January 20, 21 and 22, 1910. The committee, consisting of Archie M. Maddock, Jr., E. C. Stover, W. Metzer, W. B. Maddock and the secretary of the Chamber of Commerce, recently made the engagement for the above dates. It is expected that there will be three sessions on Thursday and Friday and two on Saturday.

PUBLIC COMFORT STATIONS

PUBLIC COMFORT STATION AT PEORIA.

Peoria, Ill.—A public comfort station is being constructed at the court house in this city at the expense of the county.

INDIANAPOLIS SOON TO HAVE PUBLIC COMFORT STATIONS.

Indianapolis, Ind.—Mayor Bookwalter has succeeded in persuading the city council to act in the matter of establishing public comfort stations in this city, and work on the first one of these conveniences will be commenced in the very near future. The Commercial Club, in this city, some time ago appointed a "Committe on Public Comfort," consisting of Geo. W. June and others, who have done good work along this line in calling attention to the need and the desirability of building such structures.

MIDDLE STATES

Mishawaka, Ind.—The Bryce Heating Company has secured the contract for the installation of a heating system in the new high school building.

Grand Rapids, Iowa.—The New York Plumbing Company has secured the contract for the plumbing in the Ewald residence on Park avenue.

Lincoln, Ill.—Jones & Koehnle, of this town, have secured the contract for the plumbing and heating in the new First Baptist church. The contract amounts to $1,500.

Dubuque, Iowa.—Linehan & Molo, of this city, have secured the contract for the installation of plumbing and heating systems in the McFadden Coffee & Spice Company's new building.

Chicago, Ill.—The Chicago North Shore Plumbing and Heating Company has been incorporated with a capital of $2,500. The incorporators are C. A. Lundberg, E. J. Saxe and F. S. McClory

NOTES FROM THE WEST

Durango, Colo.—Gorman & Rivers have changed their firm name to the Durango Plumbing and Heating Company.

Houston, Tex.—Collins Brothers, of this city, have secured the contract for the plumbing and heating in the Hale County's new courthouse and jail. The consideration amounts to $6,456.

St. Louis, Mo.—H. C. Frey has opened a plumbing and heating establishment at 4668 St. Louis avenue. He would like to receive catalogues from jobbers and manufacturers of plumbing and heating goods.

PENNSYLVANIA

Connellsville, Pa.—Britt & Skerry have the plumbing work in the section of the Cottage Hospital that is being remodeled.

Scottdale, Pa.—The Scottdale Plumbing Company is installing the plumbing and heating in the new residence being erected by R. F. Grantham.

Saegerstown, Pa.—Strauss & Smith have been awarded the contract for plumbing and heating in the I. O. O. F. building. The consideration amounts to $900.

Scranton, Pa.—Arthur C. Monies, formerly plumbing inspector in this city, has been awarded the contract for the plumbing in School Building No. 27. The consideration is $1,990.

Pittsburg, Pa.—Ira A. Mann, of 17 West Parkway, has been awarded the contract for the plumbing in the new office building and tool rooms being erected for the Pressed Steel Car Co.'s Allegheny plant. The building was designed by the company's engineer. It is two stories in height, 60x100 ft., and contains large toilet rooms.

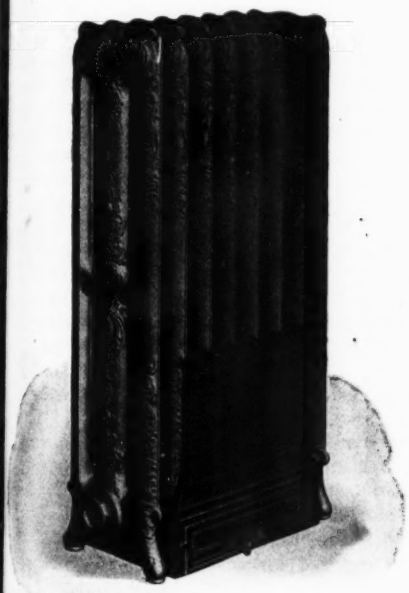
PACIFIC COAST

Oakland, Cal.—A number of important contracts are being let for construction work on a Y. M. C. A. building in Berkeley, funds having been raised for the construction of a fine building. Work on the San Francisco building for the association is progressing very rapidly and the piping for plumbing fixtures is being installed.

San Francisco, Cal.—School work continues to occupy the attention of many firms in the plumbing, heating and ventilating business and within the course of the next few months some very large contracts of this character will be finished. Bids are now being invited for the installation of the heating and ventilating system in the new Denman school and plans are being drawn for a number of new schools so that there will be no stop in work of this character. P. H. McCarthy, the new Mayor-elect, promises immediate action along the line of the rebuilding of public structures and it is expected that it will not be long until something definite is decided in reference to the new City Hall. Work is progressing very favorably on the new Hall of Justice and some of the rough plumbing can soon be installed. Work has been commenced on the new county hospital and there will be much work to be done in this $2,000,000 structure.

Merchant Instincts

The "merchant instinct" which draws young men into business for themselves—and helps established dealers to grow in commercial strength, is a wide-awake trading ability. It is based not alone on salesmanship, but equally upon a keen discernment in selecting a strong line of salable goods, and in being ready to show and explain the things which best fit the demand.



An attractive display of AMERICAN RADIATORS focuses a general advertising impression into tangible sales.

IDEAL Boilers and AMERICAN Radiators register high water mark among live business getting dealers as a salable line of heating goods. The unstinted praise of satisfied customers and the unceasing demand of house-owners for our widely advertised Low Pressure Steam and Hot Water Heating Outfits are warrants of commercial success which every dealer should heed.

AMERICAN RADIATORS & IDEAL BOILERS

A Heating Outfit is More Efficient with NORWALL and SYLPHON SPECIALTIES

AMERICAN RADIATOR COMPANY

General Offices, 282-286 Michigan Ave., Chicago.

New York	Cincinnati	Cleveland	Atlanta	Brantford, Ont.	Denver
Philadelphia	Boston	Milwaukee	Minneapolis	Seattle	St. Louis
Pittsburg	Buffalo	Indianapolis	Kansas City	Omaha	San Francisco
Washington					

SOUTHERN NOTES

Fairmont, W. Va.—The Mountain City Plumbing and Electrical Company is doing the plumbing work in the Mononga Glass Company's new office building.

Grafton, W. Va.—A. E. Jackson has moved his plumbing establishment from 11 W. Main street to larger and more convenient quarters at 18 W. Main street.

Morgantown, W. Va.—Clyde Brand is installing a pneumatic system of plumbing and a hot-water heating system in the residenct being erected by Otto Donnelly.

Grafton, W. Va.—The Newton Foundry Company has secured the plumbing, hot-water heating and gas work in Senator Bailey's new residence. The consideration, $1,600.

Morgantown, W. Va.—The Standard Plumbing & Supply Company has recently secured the contract for the plumbing and steam heating work for addition to Woodburn Hall, at University, W. Va., at $3,500.

Grafton, W. Va.—G. C. DeWordy, of 47-51 East Main street, is making numerous improvements around his place of business. His enlarged show-room will enable him to carry a much larger stock of plumbing goods.

Clarksburg, W. Va.—F. C. Welch Co. is doing the plumbing work in the Martin apartment building at Mononga, W. Va. The plumbing, heating and electrical work in the new National bank building at Shinston, W .Va., is being done also by the Welch Company.

Mannington, W. Va.—F. G. Hawkins has recently secured a contract for the installation of fifteen plumbing fixtures in the new automobile display room being erected by the Phillips Tool Company. Mr. Hawkins has recently closed a number of private residence jobs and is looking forward to a busy winter season.

Winston-Salem, N. C.—The Maynard-Crutchfield Company, of this city, has recently secured contracts for installation of plumbing systems in the following structures: H. Montague's hotel, $1,320; J. F. Ange's residence, J. S. Scales five new buildings, Mr. Suttenfield's and J. A. White's residences.

Morgantown, W. Va.—G. W. Joseph has started work on his $8,000 plumbing and heating contract in the eight-story office building of the Union Utilities Company. Mr. Joseph also was the successful bidder for the steam-heating work in the German Beneficial Association's new building and will begin work at an early date.

Mannington, W. Va.—J. O'Hare seems to be securing much of the large work of the state this season. Among some of his contracts underway at present is the plumbing and heating in the new $200,000 skyscraper at Clarksburg, W. Va. The building is to have modern plumbing throughout and will be heated with vacuum heat. The cost of plumbing and heating the building will reach close to $25,000.

PLUMBING SHOP VISITED BY FIRE.

Shelbyville, Tenn.—The plumbing establishment of Ellis & Gowan at the corner of Bridge street and Court square was damaged to the extent of $1,000 in the fire which visited that neighborhood last week. The loss was covered partially by insurance.

THE OFFICE BOOKSHELF

"Hydraulic Tables and Diagrams for Practical Engineers," by Capt. A. H. Garrett, R. E., 9¼×14¾ inches, 48 pages of text and tables and 24 full-page diagrams; cloth bound. Price, $5.00. Longmans, Green & Co., London, New York, Bombay and Calcutta.

The author is a captain in the British Royal Engineer service, an executive engineer in the Indian Public Works Department, and is the author of "Hydraulic diagrams for the Design of Channels in Earth by Kutter's Formula," "The Theory of Arched Masonry Dams," etc., etc., and is therefore by experience well qualified to place a new work of this kind before the engineering profession. In 1907 Capt. Garrett privately published a set of five diagrams giving the velocity and discharge by inspection for canals from one to twelve feet deep, at slopes from one in one hundred to one in one thousand. Engineers engaged in Indian irrigation works gave such a cordial reception to these diagrams that the author was induced to compile similar diagrams for pipes and sewers. These diagrams, with letterpress and tables, are in the work now under consideration. The very rapid development of irrigation work in this country, and the steady growth in sewer and drain construction, is calling for the service of trained hydraulic engineers in a constantly increasing degree. Any publication which will relieve the engineer from laborious arithmetical calculations, and their attendant errors, should be given a hearty welcome. Capt. Garrett's aim in producing this work has been "to reduce the labor of hydraulic calculations to the lowest possible limit consistent with the accuracy which is required for practical work."

The following chapter heads indicate the treatment of the letterpress.

Hydraulic units and their conversion from one system to another; hydraulic calculations and the accuracy to be expected of them; weight and density of water; arifices, weirs and notches; flow of water in pipes; flow of liquids in sewers; flow of water in open channels.

These headings are much abbreviated, but they serve to intimate the treatment Capt. Barrett has given the text.

There are fifty-four tables of which I cannot give the entire list, but I note especially "weight of lead required for joints required for cast iron pipes." It is as follows:

Diameter for pipe in inches.....	48	36	18	9	4
Lbs. lead for one joint.....	80	50	21	10	5

I also note "brickwork required for old pattern egg-shaped sewers" and the same for the new pattern. This table gives the radius of the top of the sewer, dimensions of sewer in inches, area of sewer in square feet, brick work required in cubic yards in lineal yard run, when the walls are 4½ inches, 9 inches or 13½ inches.

The diagrams are platted to show the required information on these subjects:

Weir discharges; new asphalted pipes, running full; incrusted pipes, running full; rivetted pipes, running full; thickness and weight of cast iron pipes; circular

sewer or pipes; egg-shaped sewer, old and new shapes, running two-thirds full; five diagrams, in colors, of discharges and velocities; by inspection for canals from one to twelve feet deep, and up over 300 feet wide, at slopes from one in one hundred to one in one thousand, and these are available for any value of Kutter's coefficient of rugosity N.

I believe this work will meet with a warm reception from hydraulic engineers in the United States.

J. K. A.

The Architects' Directory and Specification Index, for 1909. 7x10, 212 pages, cloth bound, Wm. T. Comstock, 23 Warren street, New York City, $3.00. This annual publication appears now with the ninth edition, with new features which make it more valuable as a reference book. Among the lists this year which are particularly desirable are the architects to Boards of Education and a list of architectural societies of the world. There are listed the names and addresses of 6,523 architects in the United States, 779 in the Dominion of Canada, 109 in Cuba and 10 in Porto Rico.

Washington, D. C.—Sealed proposals will be received at the office of Supervising Architect James Knox Taylor until 3 o'clock p. m. on December 22, 1909, for **the alterations, including plumbing and drainage,** in the United States Appraisers' Stores, to accommodate a power plant to be installed in the U. S. Custom House and the U. S. Appraisers' Stores at San Francisco, Cal., in accordance with the drawings and specification.

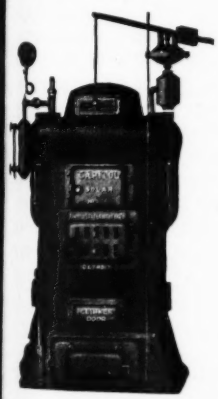
THE SHOP BOOKSHELF

Being a brief mention of late publications which are worthy of special notice because of their unusual interest to the trade. They should be on "The Shop Bookshelf" in every plumbing and steam fitting establishment for instant reference. A free copy of any publication referred to under this heading may usually be had by mentioning "Domestic Engineering" when you write.

From the Wolverine Brass Works, Grand Rapids, Mich.: A 6x9-inch booklet of twelve pages, giving prices and points of interest on the several types of Dale ball cocks. The book is attractively printed and the half-tone illustrations are first-class, very clear and distinct.

From the Central Supply Co., Minneapolis, Minn.: General Catalog "B". This is a handsome cloth-bound volume 6x9 inches in size and contains 740 pages. The goods listed cover a wide variety of high-grade sanitary fixtures, heating appliances, gas, water and mill supplies. The book is profusely illustrated on every page with clear half-tone engravings. One of the attractive and interesting features of the work is photographic reproductions of model modern bath rooms shown, with complete descriptions of the contents of each, with estimated cost. As a general catalog it is remarkably complete, well arranged and comprehensively indexed, making a valuable and necessary addition to the shop book-shelf of any plumber or heating contractor in the great Northwest.

CAPITOL BOILERS AND RADIATORS



For Low Basements

The Capitol Solar is especially adapted for use in basements with low ceilings or where the installation is particularly hard. There are 19 sizes—steam and hot water—with different heights so that you can use either a two, three, four, five or six piece boiler. No unweildy circulating pipe to interfere—circulation is taken care of in the boiler itself. Smoke hood can be set at any horizontal angle. Boiler can be set in front or at either side of the flue.

Capacities: { Steam, 225 feet to 1,200 feet. / Hot Water, 375 feet to 2,000 feet.

Catalogue and description on request.

United States Heater Company.

General Offices and Works: Fort St. and Campbell Ave., DETROIT, MICH.

BRANCHES:

NEW YORK	129 Worth St.
CHICAGO	34 Dearborn St.
OMAHA	916 Farnam St.
DETROIT	139 Jefferson Ave.
KANSAS CITY OFFICE	413 N. Y. Life Bldg

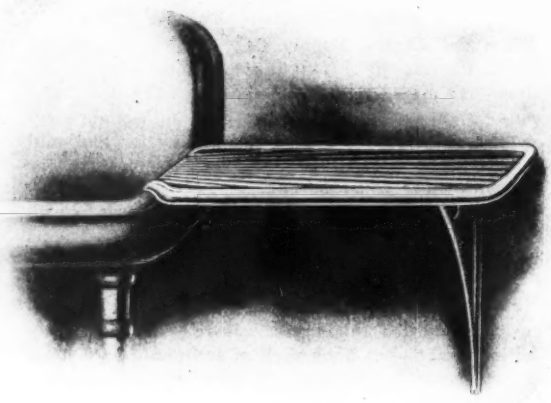
SALES AGENCIES:

MINNEAPOLIS, MINN.,	Plumbing & S. F. Supplies Co.
ST. LOUIS, MO.,	L. M. Rumsey Manufacturing Co.
DENVER, COLO.,	Kellogg & Stokes Stove Co.
DULUTH, MINN.,	Duluth Plumbing Supplies Co.

WITH THE MAKERS

An Attractive Drainboard.

A very attractive fixture in drainboards is being made by the John Trageser Steam Copper Works, of 447 to 457 W. 26th street, New York, N. Y. It is made of German silver and white metal and is furnished complete with bracket as shown in the accompanying illustration, and can be furnished in three regular sizes. The manufacturers advise us that they are making a very low price for their high-grade



Drainboard of German silver and white metal.

work, full particulars of which will be sent on request, mentioning this article.

A Special Pipe Hanger.

The rapid increase in the construction of concrete buildings and the more general practice of the installation of automotic sprinkler systems, has created the need for a special type of pipe fasteners. Illustrated herewith is a new anchor and hanger recently brought out to meet this need. This anchor is designed to be

The F. & M. pipe hanger.

placed in the ceiling during the construction of the building. Its special feature is the revolving disc on the bottom, which is set flush with the ceiling. A hole is tapped ⅞ of an inch at the center, making perfect alignment possible without disturbing the anchor or ceiling. The hanger shown is made of malleable iron in two pieces riveted at the bottom. The hexagon nut is made to turn easily after the hanger is in place, making a vertical adjustment easy, and leaving a rigid fastening.

This and a very large line of other hangers is shown in the manufacturer's catalog, which will be mailed free upon application to Fee & Mason, 83 Beekman street, New York, N. Y., mentioning "Domestic Engineering."

A New Hot Water Heater.

The arrangements for hot water supply in the home are very important, and although there have been changes in methods during the past six or eight years, it is probably the case that for some purposes there is nothing so complete and satisfying in its service as

The "Ohio M" heater.

the instantaneous water heater for ordinary gas, natural gas, acetylene gas or gasoline. There are several excellent makes on the market and years of use has made many friends for this system of hot water supply. The Dayton Supply Co., of Dayton, Ohio, has recently put out a heater styled the "Ohio M", for which it claims some unusual merits. Foremost among these claims is the new principle of construction which causes the heater to burn without odor and with no condensation. The heater has safety devices for lighting and is claimed to be modern in every way. By mentioning this article complete details may be had of the manufacturer.

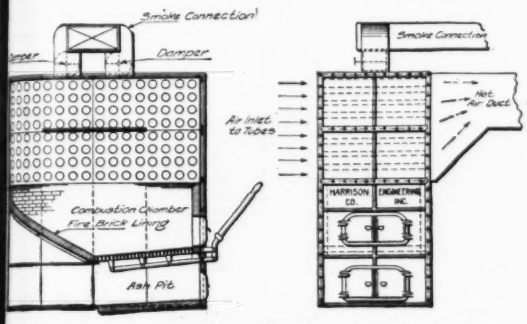
The Harrison Method of Heating.

Air, the natural conveyor of heat, warmed to the desired temperature and supplied in sufficient volume, performs the double office of heating and ventilating. The fan system, so commonly used in large buildings, has proven eminently satisfactory largely because the quality and quantity of air and the point of admission are easily controlled, and the action of the system is positive under all atmospheric conditions.

Heretofore in the fan system, steam coils have been used for heating the air to the desired temperature, requiring a boiler, feed pumps, traps, and other auxiliary

steam apparatus. Attempts have been made to simplify the heating system by using a fan in connection with the ordinary hot air furnace. Generally speaking these attempts met with little success, because in arrangement the heating surface is not adapted to the higher velocities of air, and the area is not sufficient to transmit the larger quantity of heat.

The Harrison method of heating has solved the problem by arranging the heating surface in the form of tubes. The heater takes the place of the steam coils and renders unnecessary the steam boiler, feed water heater, boiler



Sectional views of the Harrison air tube heater.

feed pump, return pumps, steam coils, traps, and other apparatus. The Harrison air tube heater resembles a sectional water-tube boiler except that instead of water the air for heating and ventilating passes through the tubes at high velocity, in most cases impelled by the fan.

The air tubes, which are 4 inches in diameter and 4 feet long, are supported at the ends and in the center, and are located just above the combustion chamber, which is of cast iron lined with fire brick. The tubes and all casings are of cast iron. Patent joints between the tubes and tube sheets and the different parts of the casing allow for expansion and contraction and prevent the escape of gas.

The hot gases from the fire rise from the combustion chamber and are distributed amongst the tubes by a baffle before they pass to the smoke connection. At the same time the fan forces air through the tubes which form sufficient heating surface to raise it to the desired temperature; it then passes through ducts and flues to the apartments to be warmed, as in the case of the fan system having a steam heater.

In addition to saving cost and the operating expense of steam coils, boilers, and auxiliaries, the Harrison method requires less fuel, for the heat of combustion is applied almost directly to the air without the use of any other medium. With steam coils the heat must first pass to the water in the boiler converting it into steam, from which it is later transmitted to the air passing through the coils.

The Harrison method insures high efficiency. This is evident from the fact that the system has no transmission piping with attendant losses due to leakage and radiation; there is no waste of heat because of returns and traps; and the efficiency of the Harrison air tube heater itself is greater than that of any boiler operating under ideal conditions at full load. In fact the total amount of heat wasted with the Harrison method is about one-half as great as in the fan system using a steam heater.

In systems requiring a steam boiler it is evident that no heat can be transmitted to the air until the water is heated to at least 212 degrees. The air passing through the Harrison air tube heater is warmed in about a half hour after the fire is started to a temperature equal to that of air passing through a steam heater an hour after the fire is started beneath the boiler.

With the Harrison method the temperature of the air is easily and quickly regulated, and can be controlled by thermostatic regulation of the draft and smoke pipe dampers. The heater is easily cared for by an ordinary fireman, an expensive licensed engineer being entirely unnecessary, for this heater cannot blow up.

The Harrison air tube heater is so designed that all parts of the casing are interchangeable, and the few repairs can be made by an average mechanic in an exceedingly short time. The drawing of the fire and replacing of tubes requires but a half hour, and the entire heater may be taken down and re-assembled over night. The repair parts are inexpensive; the cast-iron construction insures low cost of both depreciation and maintenance.

The heater being only 8 feet in height allows sufficient head room for the overhead flues in the basements of school houses and public buildings, and the system can be easily arranged so that the hot air duct will be above the tempered air duct.

The Harrison air tube heater is of large capacity because of the high efficiency of the heating surface. It is a well-known fact that the transmission of heat through metal surfaces depends upon the difference in temperature on the two sides and upon the rapidity with which the air flows over the surface.

PATENTS

941,496. Smoke-Consuming Attachment for Furnaces. Walter P. Choitz, Chicago, Ill.

941,531. Manhole Cover-plate. Edward Oldman, Buffalo, N. Y., assignor to Farrar & Trefts, Buffalo, N. Y., partners.

941,539. Water-closet and Tank. Joseph W. Sharp, Jr., Philadelphia, Pa.

941,540. Washbasin . Joseph W. Sharp, Jr., Philadelphia, Pa.

941,544. Bath-tub Seat. John A. Skogsberg, Chicago, Ill.

941,563. Water-meter. Henry I. Dilts, New York, N. Y., assignor to Neptune Meter Company, New York, N. Y., a corporation of New Jersey.

941,596. Automatic Anti-scalding and Mixing Valve. Frederick L. White, Cambridge, Mass.

941,597. Hot Water House-heater. Margaret A. Wilcox, Los Angeles, Cal.

941,618. Water Heater. Henry R. Churchill, Buffalo, N. Y.

941,668. Vent-cap. John R. Williams, Milwaukee, Wis.

Burlington, Iowa.—The Russell Sewage Disposal Company, of this city, recently sold five sewerless sewage disposal systems to A. C. Rowland at Rushville, Ill., which he has installed in his vicinity.—Adv.

CLASSIFIED ADVERTISEMENTS

The rate of advertising under this heading is 25 cents a line, or 5 cents a word, for an insertion, remittance to be made with order. To insure insertion in this column copy should be received not later than Wednesday morning.

Help Wanted.

WANTED—Young man of good moral character and ability to fill a responsible position and invest $25,000 in an established plumbing supply house in the middle west. In making application give full name and address and references; also give age and nationality. Address No. 184, "Domestic Engineering," Chicago.

WANTED—First-class representative by a large manufacturer of boilers and radiators, for the State of Ohio. Thorough experience in the heating business, both as engineer and salesman, required, also a person acquaintance with the trade in the locality mentioned. State experience, present employment, references and salary desired. Address No. 174, "Domestic Engineering," Chicago.

Situations Wanted.

WANTED—By a first-class plumber, steam and hot water fitter, neat and quick lead worker, a hustler and up-to-date; can estimate from plans and draw plans; capable of taking charge of work; 18 years' experience, positively sober; married; best of reference; south preferred. Address P. O. Box 118, Kirksville, Mo.

For Sale.

FOR SALE—Patent No. 846275, Valved Outlet for Waste and Overflow Pipes. Will sell outright or part cash and royalty. D. W. Y., 3 Temple St., N. Abington, Mass.

Plumbing Schools.

LEARN PLUMBING on new buildings in four months. Tools furnished. Master Plumbers' Trade School, 3659 Finney Ave., St. Louis, Mo.

BOOKS.

Sanitary Sewerage of Buildings. By Thos. S. Ainge. An authoritative statement of the principles and practice of sewering buildings, including the design and construction of plumbing systems, disposal of sewage in unsewered localites, etc.; 8x5 inches; bound in cloth; 209 pp.; postpaid, $1.50. "Domestic Engineering," Chicago.

Plumbing Catechism. By Charles B. Ball. Second edition. This book formulates, in question and answer form, the basic principles of plumbing design and practice. It is therefore especially commended to students in engineering and trade schools, and to master and journeymen plumbers, preparing for examinations. Bound in cloth; 6¾x4¾ inches; 100 pp.; postpaid, $1.00. "Domestic Engineering," Chicago.

Salesmen's List of Jobbers of Plumbing Supplies. Bound in cloth; pocket size. Sent postpaid for one dollar. "Domestic Engineering," Chicago.

Sanitation in the Modern Home. By Jno. K. Allen. An invaluable guide to the architect, plumber, heating engineer and house owner, telling just what is necessary to make a house completely sanitary from the subsoil to the roof. 8x5¼ inches; 272 pp.; bound in cloth; postpaid, $2.00. "Domestic Engineering," Chicago.

Roughing-in House Drains. Edited by Jno. K. Allen. A complete guide to the work of roughing-in plumbing, from the digging of the sewer to the finishing length of the soil and vent stacks, giving each step to be taken and telling how and why it is done. 6¼x4¼ inches; 184 pp.; bound in boards. Postpaid, 50 cents. "Domestic Engineering," Chicago.

Notes on Heating and Ventilation. Second edition. By Prof. John R. Allen. Written primarily for the steamfitter and designer of heating systems. Reduced to as brief a form as possible, so that readers can readily find notes or data desired. Bound in cloth, 6¾x4¾ inches; 272 pp.; postpaid, $2.00. "Domestic Engineering," Chicago.

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Dean's Steamfitter's Computation Book. Contains figured cubical contents of rooms of different sizes and ceiling heights; also tables showing radiation necessary at various rates per square foot of glass surface, wall surface, or cubic feet; also square feet of glass or wall in surfaces of various dimensions; also cost of selling price of radiators at various market prices. These tables save fitters thousands of arithmetical calculations, giving the answers ready to hand. Leather bound; 7¾x5 inches; 90 pp.; postage prepaid, $2.50. "Domestic Engineering," Chicago.

Dean's System of Greenhouse Heating by Steam or Hot Water. Directions for obtaining different temperatures; tables of radiation necessary per square foot of glass; tables giving glass surface; sizes of flow and return pipes; explanations so simple all fitters may understand. Cloth bound, 7¾x5⅛ inches; 46 pp.; postage prepaid, $2.00. "Domestic Engineering," Chicago.

Tables for Calculating Sizes of Steam Pipes. By Isaac Chaimovitsch. These tables furnish a method of determining sizes of steam pipes for low pressure heating without laborious mathematical calculations; bound in cloth; 4½x6⅞ in.; 47 pp.; postpaid, $2.00. "Domestic Engineering," Chicago.

Swimming Pools. By. Jno. K. Allen. Their construction; cold and hot water supply; various methods of heating the water; directions as to selecting correct sizes of heaters. A practical guide to the subject. Over thirty illustrations; 6½x4¾ inches. Postpaid, 50 cents. "Domestic Engineering," Chicago.

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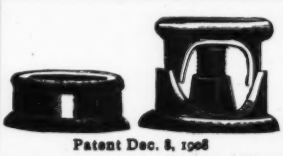

Adjustable Radiator Foot Rest

The time saved on each job pays for them—can be used for bath tubs and other fixtures

The Jennison Company, Fitchburg, Mass.

Patent Dec. 8, 1908

Sold by Jobbers